

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Mechanism for Feeding a Web of Paper, Cardboard, or the like to a Treating Machine

We, FR. HESSER, MASCHINENFABRIK-AKTIEGESELLSCHAFT, a Company organised under the laws of the Federal Republic of Germany, of 99, Nauheimerstrasse, Stuttgart-Bad Cannstatt, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a mechanism for feeding a web of paper, cardboard, or the like to a treating machine from a replaceable supply roll, this mechanism comprising means for rotatably supporting the supply roll in the operative position during normal feeding—of the web therefrom, means for raising this roll for insertion of a new roll and mounting of the latter on the supporting means, and an endless belt movably mounted and controlled to remain in driving engagement with the periphery of the supply roll effective at any time to feed its web to the treating machine.

The mechanism according to this invention can be used, with advantage, in connection with any treating machine to which a web of paper or like material is to be supplied from a replaceable supply roll. The mechanism is, however, of particular advantage where the end of a running off or finished web is joined automatically or semi-automatically to the leading end of a new or fresh roll, for example when used in conjunction with the invention set forth in our Patent Application No. 10775/55 (Serial No. 793,936). Other features of the invention are set forth in the claims hereto.

The invention is illustrated by way of example, in the accompanying drawings, as applied to a mechanism from which cardboard is fed in web form to a rotary printing machine.

Figure 1 is a side elevation of the feeding mechanism and

Figure 2 is a plan view corresponding to Figure 1.

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The feeding mechanism illustrated is mounted on a frame 2, and the base plate of this frame is recessed for the admission of fresh rolls of cardboard. Provided at the inner end of this recess is an abutment 3, which is adjustable to suit different diameters of inserted fresh rolls. When such a roll has been introduced into the mechanism, by rolling along the aforesaid recess, and is located by the abutment 3, it will, as indicated by the roll 1 shown in full lines in the drawings, have its shaft 5 disposed over lifting devices 4, one of these being arranged at each side of the machine and each consisting of a known form of hydraulic or mechanical jack. In the particular case illustrated, it will be assumed that each jack 4 is hydraulic and that a supply of pressure oil to the cylinder thereof can be used to lift the inserted and positioned roll 1, so that it just clears the floor or the underlying part of the base plate and is thereby free for rotation.

Moreover, a lateral adjusting means consisting of a spindle 6 with an operating hand wheel 7 is provided for lateral adjustment of the inserted roll 1 so as to centre it correctly in the mechanism, this spindle carrying a disc 8 engaging a disc 9 secured to the shaft 5, such that any required lateral shifting can be performed by turning the wheel 7 and thereby screwing the spindle 6 in a fixed part of the frame of the mechanism.

During the actual feed of the web from the roll of cardboard to the treating machine, this web runs off the upper part of the roll, the roll being rotated by an endless belt 10 engaging the periphery thereof. This belt runs over a pulley 77 carried on a pivotally-mounted supporting frame 11, a pulley 71 mounted on a drive shaft 70 extending across the width of the frame 2, and a pulley 76 carried by levers 11¹ pivotable on the frame 11 and biased by tension springs 11². The frame 11 is pivotable by a positioning motor 12, when required, so as to lower the bottom run of the belt 10 and maintain it in, or

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bring it into contact with the roll 1 concerned. The drive shaft 70 is driven to rotate the pulley 71 and thus move the belt 10, from a main power source by means (not shown) through a gear unit 69. The transmission ratio of the latter is variable under the direction of a motor 73 in response to the demands of the machine to which the running-off web is being fed.

Thus, as the web is fed over the roll to the treating machine, the reduction in diameter of the roll is compensated by the positioning motor 12 which maintains the endless belt 10 in contact with the surface of the roll. When, however, the roll has decreased by about two-thirds of its original diameter, steps are taken to initiate the insertion of a replacement roll of cardboard. To this end, the old roll is raised to the position O indicated in dotted lines in Figure 1, so as to give room for the insertion of a new roll 1 beneath it.

This lifting of the old roll is performed by hydraulic raising units 13 arranged one on each side of the mechanism. Each of these units 13 comprises a piston cylinder assembly 14 consisting of three telescoping cylinders 15 which are extensible from the full line to the dotted line positions indicated in Figure 1. At their upper ends, each of the piston cylinder assemblies 14 carries a bracket engaging at one end beneath the corresponding end part of the shaft 5 of the roll and having, at its other end, a collar embracing a guide pillar 16. Thus, by appropriate supply of pressure fluid to the piston cylinder assemblies 14, the old cardboard roll can be lifted vertically to the position O. Despite this movement, the roll will be maintained in contact with the endless belt 10 by the motor 12 acting on the frame 11, and by virtue of the compensating adjustment of the run of the belt automatically allowed by the pivoting of levers 11', whereby the rotation of the roll is not interrupted.

When the new roll has been inserted, with the old roll at position O and still reeling off cardboard, it is held off the floor or ground by means of the units 4, as previously described, extends into a web-joining machine such as that described in our co-pending Application No. 10775/55 (Serial No. 793,936).

Meanwhile the old roll at position O continues to run until it is almost completely exhausted, when it is swung into the position indicated at S in Figure 1.

To enable this to be performed, each of the units 13 is pivotally mounted at 20 on the frame of the mechanism, and the lower cylinder of this assembly is connected, through a link 19, with the piston 18 of a pressure cylinder 17 arranged horizontally at the corresponding side of the machine. Thus, by applying pressure appropriately to the cylinders 17, the assemblies 13—16 can be rocked

about their pivot points 20, and in so doing are guided by means of anti-friction bearings 21 which are carried by the guide posts 16 and run in arcuate guide slots 22 in the machine frame 2. At the same time that the assemblies 13—16 are swung back, the belt 10 is correspondingly displaced by the positioning motor 12, so that the old web II will then be positioned immediately above the new web I ready for the joining of these webs to take place.

The supply and exhaust of oil pressure to and from the lifting units 4, the raising units 13, and the cylinders 17 are conveniently controlled from an electrohydraulic control unit (not shown) of known push-button type secured to the main frame of the mechanism, and operable from a control panel or from a movably-supported control table.

Instead of a push-button control unit, a fully-automatic control means can be used to operate the parts 4, 13 and 17. Such means may comprise a unit provided with electro-optical, electrical, or mechanical scanning or feeler members which are arranged to sense the diameter and position of the running-off supply roll so that, when the necessary signal or movement is given, the appropriate hydraulic fluid flow will be initiated. The pressure oil is supplied by a suitable compression pump from a reservoir 24.

Although one specific form of mechanism according to this invention has been described above in reference to the accompanying drawings, it will be appreciated that changes may be made in the details thereof, in addition to those already mentioned, within the scope of the accompanying claims.

What we claim is:—

1. Mechanism for feeding a web of cardboard, paper or the like to a treating machine from a replaceable supply roll, this mechanism comprising means for rotatably supporting a supply roll in the operative position during normal feeding-off of the web therefrom, means for raising this roll for insertion of a new roll and mounting of the latter on the supporting means, and an endless belt movably mounted and controlled to remain in driving engagement with the periphery of the supply roll effective at any time to feed its web to the treating machine.

2. Mechanism according to Claim 1, in which the roll-raising means comprise extensible piston and cylinder assemblies engageable with the shaft of the effective supply roll, these assemblies being pivotable on the frame of the mechanism, whereby they are adapted to swing the old supply roll into an out-of-the-way position to leave the endless belt in driving engagement with the new roll.

3. Mechanism according to Claim 2, in which the piston and cylinder assemblies are movable into the out-of-the-way position by

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further piston and cylinder assemblies.

4. Mechanism according to Claim 2 or 3, in which each of the extensible piston and cylinder assemblies consists of a plurality of telescopic pistons and cylinders, and each carries a guide collar which is slidable on a post pivotable with the assembly concerned and having a part slidable in an arcuate guideway in said frame during the pivoting movement of the assembly and post.

5. Mechanism according to any of Claims 2 to 4, in which an electric motor, mounted on one of the extensible piston and cylinder assemblies, is engageable with the shaft of the old roll for the purpose of rotating the latter in the winding-up direction when this roll has been replaced.

6. Mechanism according to any of Claims 1 to 5, in which the said supporting means and the roll-raising means are controlled by an electro-hydraulic push button operated control unit.

7. Mechanism according to any of Claims 1 to 5, in which the said supporting means

and the roll-raising means are controlled by an automatic control unit provided with electro-optical, electrical, or mechanical scanning or feeler members arranged to sense the diameter and position of the running-off supply roll.

8. Mechanism according to any of Claims 1 to 7, in which the mounting of the endless belt includes a driving pulley which is operable from a power source through a variable-ratio transmission gear.

9. Mechanism according to Claim 8, in which a positioning motor is associated with said gear and is operable from the treating machine to vary the transmission ratio of this gear.

10. Feeding mechanism as claimed in Claim 1 and substantially as herein described with reference to Figures 1 and 2 of the accompanying drawings.

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COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

